Carcinoma of the External Auditory Canal

Permsarp Isipradit, MD*, Winai Wadwongtham, MD*,
Songklot Aeumjaturapat, MD*, Phooripan Aramwatanapong, MD*

** Department of Otolaryngology, Faculty of Medicine, Chulalongkorn University*

Carcinoma of the external auditory canal is one of the most inaccessible areas of the body. It is a rare malignant neoplasm with an aggressive nature and an overall poor prognosis. In a ten year period, 16 patients were treated in King Chulalongkorn Memorial Hospital. From TNM staging proposed by the University of Pittsburgh, the authors found T1 = 1, T2 = 6, T3 = 5, T4 = 4 cases. In 14 patients who were operated on (radical mastoidectomy in 8, lateral temporal bone resection in 5, sleeve resection in 1), 7 had cured (50%), 7 were recurrence. 6 cases of recurrence developed in patients with radical mastoidectomy, 1 case with lateral temporal bone resection. The overall cure rate in stage I-II = 85.71% (6/7) but only 11.11% (1/9) in the advanced stages (III-IV). The present data suggest that in early cancer (stage I-II) the lateral temporal bone resection with postoperative radiation is better than radical mastoidectomy with postoperative radiation.

Keywords: *Carcinoma of the external auditory canal, Treatment, Temporal bone resection*

J Med Assoc Thai 2005; 88(1): 114-7
Full text. e-Journal: *http://www.medassocthai.org/journal*

Carcinoma of the external auditory canal is infrequent, with an incidence of approximately 1 per million population per year. It has an aggressive nature and a poor prognosis. The prognosis of squamous cell carcinoma of the external auditory canal is mostly related to the extent of the primary lesion[1-6].

No consensus exists as to the type of procedure that should be chosen. Some authors advocate en bloc resection, the extent of which is determined by preoperative imaging techniques[1,2,4-6]. Others advocate that surgery should be guided by intraoperative findings in a piecemeal manner[3,7]. Due to the close proximity of many vital structures to the temporal bone, which has made en bloc resection technically difficult and subject to significant morbidity and mortality. The dense bone of the skull base is thought to reduce the effectiveness of irradiation therapy as the single modality of treatment, so the combination of surgery and postoperative radiation should be the treatment of choice for this cancer[7-10].

The purpose of this article was to review the treatments, prognostic variables, and outcome of patients with squamous cell carcinoma of the external auditory canal treated in our department.

Material and Method

The records of all patients who had undergone treatment in our institute for carcinoma of the external auditory canal (EAC) from 1994 to 2003 were retrospectively reviewed. Age, sex, symptoms, TNM staging, histological diagnosis, type and extent of surgery were recorded.

A radiographically based TNM staging system proposed by investigators at the University of Pittsburgh was used to separate these patients into T stages based on extent of disease (Table 1).

The operations were classified as[1,2,11]

Sleeve resection

A sleeve resection of the EAC removes the cartilaginous EAC and some or all of the bony canal wall skin circumferentially without bone removal. This type of procedure generally is reserved for malignancies localized to the cartilaginous EAC.

Radical mastoidectomy (RM)

Radical mastoidectomy eradicates disease of the middle ear and mastoid in which the mastoid, antrum, and middle ear are exteriorized so that they form a common cavity with the external auditory canal.

Correspondence to : Isipradit P, Department of Otolaryngology, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

Lateral temporal bone resection (LTBR)

LTBR removes en bloc the entire osseous and cartilaginous EAC and tympanic membrane using extended facial recess approach.

Table 1. University of Pittsburgh TNM staging system proposed for external auditory canal squamous cell carcinoma

T status

T1 - tumor limited to the external auditory canal without bony erosion or evidence of soft tissue extension

T2 - tumor with limited external auditory canal bony erosion (not full thickness) or radiographic finding consistent with limited (< 0.5 cm) soft tissue involvement

T3 - tumor eroding the osseous external auditory canal (full thickness) with limited (< 0.5 cm) soft tissue involvement, or tumor involving middle ear or mastoid, or patients presenting with facial paralysis

T4 - tumor eroding the cochlea, petrous apex, medial of middle ear, carotid canal, jugular foramen or dura, or with extensive (> 0.5 cm) soft tissue involvement

N status

Involvement of lymph nodes is a poor prognostic finding and automatically places the patient in an advances stage (i.e. stage III [T1N1] or stage IV [T2, 3 and 4, N1])

M status

Distant metastasis indicates a poor prognosis and immediately place patients in the stage IV category

In the absence of metastatic lymph nodes or distant metastases, T status of the tumor defines the clinical stage

Subtotal temporal bone resection (STBR)

STBR essentially allows en bloc resection of the medial surface of the mesotympanum, leaving the air cells of the petrous apex and portions of the bony labyrinth.

Total temporal bone resection (TTBR)

TTBR involves an en bloc resection of the temporal bone, including the petrous apex and the sigmoid sinus.

Results

Sixteen consecutive patients (7 women and 9 men) who had surgery, radiation or chemotherapy for carcinoma of the external auditory canal were included (Table 2). The mean age was 57.81years (range 31-75 years). The symptoms and signs were aural mass (12 patients), otorrhea (11 patients), hearing loss (6 patients)), otalgia (3 patients), facial palsy (2 patients), ulcer (1 patients). The histological diagnosis was squamous cell carcinoma in 14 (87.50%) of the patients, basal cell carcinoma in 1 (6.25%), and adenocarcinoma in 1 (6.25%).

The patients were staged according to the Pittsburgh system. CT scanning was performed in 10 patients. In 6 patients the extent of the tumor was judged from perioperative observations and histological examinations. None had lymph node or distant metastasis.

Table 2. Summary of 16 patients with carcinoma of the external auditory canal

Patients No.	Gender	Age	Side	Histological diagnosis	T status	Stage	Surgery	Radiation	Chemo.	Recurrence	Follow up (months)
1	m	56	Lt.	SCC	T4	IV	no	yes	yes	yes	5
2	f	58	Lt.	SCC	T3	III	RM	yes	no	no	24
3	f	49	Rt.	SCC	T3	III	RM	yes	no	yes	11
4	m	64	Rt.	SCC	T3	III	RM	yes	no	yes	10
5	m	73	Lt.	SCC	T2	II	LTBR	yes	no	yes	20
6	m	32	Lt.	SCC	T3	IV	RM	yes	no	yes	6
7	m	54	Rt.	SCC	T2	II	RM	yes	yes	yes	10
8	f	44	Lt.	AC	T4	IV	no	no	no	yes	-
9	f	62	Lt.	SCC	T1	I	sleeve	no	no	no	38
10	m	75	Rt.	BCC	T4	IV	LTBR	yes	no	yes	42
11	f	75	Rt.	SCC	T2	II	LTBR	yes	no	no	18
12	f	71	Lt.	SCC	T2	II	RM	yes	no	no	36
13	f	66	Rt.	SCC	T3	III	RM	yes	no	yes	8
14	m	31	Rt.	SCC	T4	IV	RM	yes	yes	yes	10
15	m	53	Lt.	SCC	T2	II	LTBR	yes	no	no	8
16	m	62	Lt.	SCC	T2	II	LTBR	yes	no	no	5

SCC - squamous cell carcinoma; BCC - basal cell carcinoma; AC - adenocarcinoma; RM - radical mastoidectomy; sleeve -sleeve resection or local canal resection; LTBR - lateral temporal bone resection

Eight patients underwent radical mastoidectomy, five-lateral temporal bone resection, 1 sleeve resection, postoperative radiation in 14 patients, palliative chemotherapy and radiation in 2 cases.

In 14 patients who were operated on, 7 were cured (50%), 7 were recurrent. 6 cases of recurrence developed in patients with radical mastoidectomy (range 6-11 months), 1 case with lateral temporal bone resection (42 months). The result of treatment (Table 3) by T staging were T1 = 1/1 (100%), T2 = 5/6 (83.33%), T3 = 1/5 (20%) and T4 = 0/4 (0%); but by type of surgery were sleeve resection =1/1 (100%), LTBR = 4/5 (80%) and RM = 2/8 (25%). The mean duration of follow-up was 16.73 months (range, 0-42 months).

In most of the cases the authors left the cavity open for early detection of recurrence, but obliteration in case 5 and 16. In case 5 the temporalis muscle flap and advanced facial skin for ear canal closure were used. In case 16, because of cerebrospinal fluid leakage, the cavity was filled with abdominal fat graft, and the ear canal was oversewn.

Discussion

According to the review of the literature on carcinoma of the external auditory canal, this condition was first described by Polizer in his textbook in 1883[12], since that time, this disease has been recognized to have overall poor prognosis[1-6]. Since this type of tumor is rare, it is difficult for a single center to obtain sufficient experience. The lack of an accepted staging system makes it difficult to compare the results of different groups[3,9]. Therefore, a standardized staging system is particularly desirable for these tumors. Arriaga et al from the University of Pittburgh proposed a staging system for squamous cell carcinoma of the external auditory canal, based on preoperative clinical examination and computed tomographic (CT) findings[5]. After that most of the authors accepted this system[1-4].

Table 3. Cure rates

Staging	%
T1	1/1(100%)
T2	5/6(83.33%)
T3	1/5(20%)
T4	0/4(0%)
Type of surgery	%
sleeve	1/1(100%)
RM	2/8(25%)
LTBR	4/5(80%)

The treatment of choice is surgical excision in en bloc or piecemeal manner (RM, LTBR, STBR, TTBR) with or without postoperative radiation. Some authors noted extensions of the tumor beyond the operative area along the neural route, fascial planes, and vasculature despite careful intraoperative monitoring of the margin. For this reason, they recommended adjuvant radiotherapy for all patients[7-10]. The prognosis factors included local extension and free margin from surgical excision. If the margin is not clear, all of them were recurrent despite postoperative radiation[1,2,6,8,9]. The presented data resulted in an overall cure rate of 50% (stage I = 100%, stage II = 83.33%, stage III = 20% and stage IV = 0%) that is quite similar to other papers 27-60%[6-10,13].

A LTBR is preferred by most surgeons over a RM in an effort to perform an en bloc "no touch" procedure. A radical mastoidectomy is an operation designed for inflammatory ear disease and theoretically does not provide a tumor margin during resection. Because the resulting defect is quite similar, LBTR should be favored in an effort to produce negative tumor margins[1,2,4,13].

In a meta- analysis, based on 26 publications with information on a total of 144 patients it was concluded that patients with carcinoma that is confined to the external ear canal have similar survival, regardless of whether mastoidectomy, lateral temporal bone resection, or subtotal temporal bone resection is performed: the addition of radiation therapy to lateral temporal bone resection does not appear to improve survival. If the disease extended into the middle ear, survival of patients treated with subtotal temporal bone resection appeared to be improved over those treated with lateral temporal bone resection or mastoidectomy[13]. Their experience for LTBR, which allowed en bloc resection of tumor for these lesions, remained unchanged[13].

The presented data suggest that for the early cancer (stage I-II) the lateral temporal bone resection with postoperative radiation is better than radical mastoidectomy with postoperative radiation. In advanced cases the more radical surgery (STBR or TTBR) is suggested.

References

1. Leonetti JP, Marzo SJ. Malignancy of the temporal bone. Otolaryngol Clin N Am 2002; 35: 405-10.
2. Barrs DM. Temporal bone carcinoma. Otolarygol Clin N Am 2001; 34: 1197-218.
3. Nyrop M, Grontved A. Cancer of the external auditory canal. Arch Otolaryngol Head Neck Surg 2002; 128: 834-7.

4. Austin JR, Stewart K, Fawzi N. Squamous cell carcinoma of the external auditory canal: therapeutic prognosis based on a proposed staging system. Arch Otolaryngol Head Neck Surg 1994; 120: 1228-32.
5. Arriaga M, Curtin H, Takahashi H, Hirsch BE, Kamerer DB. Staging proposal for external auditory meatus carcinoma based on preoperative clinical examination and computed tomography findings. Ann Otol Rhinol Laryngol 1990; 99: 714-21.
6. Arriaga M, Hirsch BE, Kamerer DB, Myers EN. Squamous cell carcinoma of the external auditory meatus. Otolaryngol Head Neck Surg 1989; 101: 330-7.
7. Kinney SE, Wood BG. Malignancies of the external ear canal and temporal bone: surgical techniques and results. Laryngoscope 1987; 97: 158-64.
8. Goodwin WJ. Jesse RH. Malignant neoplasms of the external auditory canal and temporal bone. Arch Otolaryngol 1980; 106: 675-9.
9. Spector JG. Management of temporal bone carcinomas: a therapeutic analysis of two groups of patients and long-term follow up. Otolaryngol Head Neck Surg 1991; 104: 58-66.
10. Kinney SE. Squamous cell carcinoma of the external auditory canal. Am J Otol 1989; 10: 111-6.
11. Medina JE, Park AO, Neely JG, Britton BH. Lateral temporal bone resections. Am J Surg 1990; 160: 427-33.
12. Polizer A. Textbook of disease of the ear. London, Balliere Tindall and Cox, 1883: 729-34.
13. Prasad S, Janecka IP. Efficacy of surgical treatments for squamous cell carcinoma of the temporal bone: a literature review. Otolaryngol Head Neck Surg 1994; 110: 270-80.

มะเร็งของช่องหูส่วนนอก

เพิ่มทรัพย์ อิสีประดิฐ, วินัย แวดวงธรรม, ทรงกลด เอี่ยมจตุรภัทร, ภูริปัณย์ อร่ามวัฒนพงศ์

มะเร็งของช่องหูส่วนนอก เป็นมะเร็งซึ่งอยู่ตำแหน่งที่ทำการรักษาได้ยาก เนื่องจากพบได้น้อยมาก และมีลักษณะการลุกลามของโรคที่รุนแรง ทำให้ผลการรักษาไม่ดี ในช่วงระยะเวลา 10 ปี พบผู้ป่วยโรคนี้ทั้งสิ้น 16 ราย ในโรงพยาบาลจุฬาลงกรณ์ โดยที่เป็นระยะที่ 1 1ราย ระยะที่ 2 6ราย ระยะที่ 3 5 ราย ระยะที่ 4 4 ราย ในผู้ป่วย 14 รายที่ได้รับการผ่าตัด เป็นวิธี radical mastoidectomy จำนวน 8 ราย, lateral temporal bone resection จำนวน 5 ราย, และ sleeve resection จำนวน 1 ราย ควบคุมโรคได้จำนวน 7 ราย และมีโรคเกิดขึ้นใหม่จำนวน 7 ราย โดยที่ 6 รายเกิดในผู้ป่วยที่ได้รับการผ่าตัด radical mastoidectomy และ 1 รายโดยวิธี lateral temporal bone resection ในผู้ป่วยระยะเริ่มต้น (ระยะที่ 1-2)ได้ผลดี 85.71% (6 ใน 7 ราย) แต่ได้ผลเพียง 11.11%(1 ใน 9 ราย) ในผู้ป่วยระยะลุกลาม (ระยะที่ 3-4) จากข้อมูลสรุปได้ว่า ในผู้ป่วยระยะเริ่มต้น การรักษาโดยการผ่าตัดวิธี lateral temporal bone resection ร่วมกับการฉายรังสี ได้ผลดีกว่า การผ่าตัดวิธี radical mastoidectomy ร่วมกับการฉายรังสี